UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 07569

CSAH NO. 90

OVER THE

BLUE EARTH RIVER

DISTRICT 7 - BLUE EARTH COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 28A)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 07569, Piers 2, 3, and 4, were in good condition with no defects of structural significance observed. The channel bottom around the substructure units consisted of firm material, which was well established and appeared stable with evidence of minor local scour at the upstream end of pier 2. Both river banks exhibited vertically eroded slopes. A large amount of timber debris has accumulated at the upstream nose of Pier 3.

INSPECTION FINDINGS:

(A) The concrete faces of all piers were in good condition with no defects of structural significance observed and only the presence of minor random hairline cracks.

(B) Scour depression was present at the upstream end of Pier 2. The maximum depth of the localized scour was 1.5 feet and no footing exposure was detected.

(C) Heavy accumulation of timber debris was observed around the upstream nose and along the west face of Pier 3.

(D) Moderate accumulation of timber debris was observed around the upstream nose and along the west face of Pier 2.

(E) Both river banks exhibited steep vertical slopes due to erosion.

RECOMMENDATIONS:

(A) Remove the accumulation of timber debris from around the upstream noses of Piers 2 and 3 before it progresses further and adversely affects the piers or their surrounding channel bottom.

(B) Monitor the vertical erosion along the river banks and the scour hole around the upstream nose of Pier 2 during future inspections.

(C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 07569

Feature Crossed: The Blue Earth River

Feature Carried: CSAH No. 90

Location: District 7 - Blue Earth County

Bridge Description: The superstructure consists of a five spans of multiple prestressed concrete beams supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and four reinforced concrete piers. The abutment footings are founded on steel H-piles, while the pier footings are founded on 48 inch diameter caissons. The piers are numbered 1 through 4 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: November 2, 2002

Weather Conditions: Sunny, "25E F

Underwater Visibility: "3 feet

Waterway Velocity: "4 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2, 3, and 4

General Shape: Each pier consists of a rectangular reinforced concrete shaft supporting a concrete hammerhead cap. The pier shafts have tapered ends with blunt noses. The piers have rectangular footing founded on caissons.

Maximum Water Depth at Substructure Inspected: Approximately 4.7 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the north end of Pier 3.

Water Surface: The waterline was approximately 26.0 feet below reference.
Assumed Waterline Elevation = 74.0

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

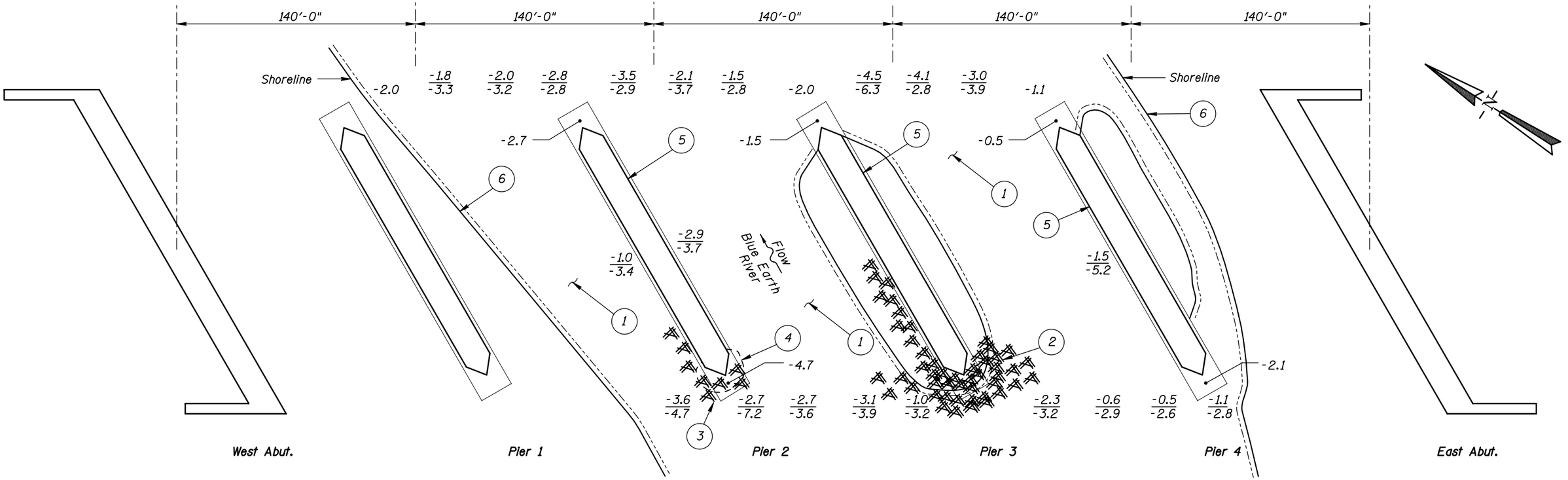
Item 61: Channel and Channel Protection: Code 4

Item 92B: Underwater Inspection: Code B/11/02

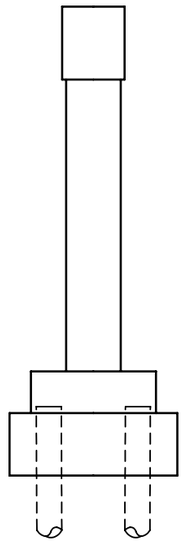
Item 113: Scour Critical Bridges: Code I/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 2 through 4 were inspected underwater.
2. At the time of inspection on November 2, 2002, the waterline was located approximately 26.0 feet below the top of the pier cap at the downstream end of Pier 3. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 74.0.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

1. The channel bottom material around the substructure units consisted of sand, gravel, cobbles, and 1 foot diameter riprap with up to 1 foot of probe rod penetration.
2. Heavy accumulation of timber debris, with pieces up to 2 feet in diameter, was observed around the upstream nose and along the west face up to the midpoint of Pier 3. The timber debris consisted of up to 2 foot diameter logs and extended from the channel bottom to 15 feet above the waterline.
3. Moderate accumulation of timber debris was observed around the upstream nose and along the west face of Pier 2.
4. Scour depression with a 7 foot radius and 1.5 feet of depth was observed around the upstream nose of Pier 2.
5. Overall the concrete of the piers was in good condition and only exhibited random vertical hairline cracks.
6. Vertical bank erosion was observed all along the river bank.

Legend

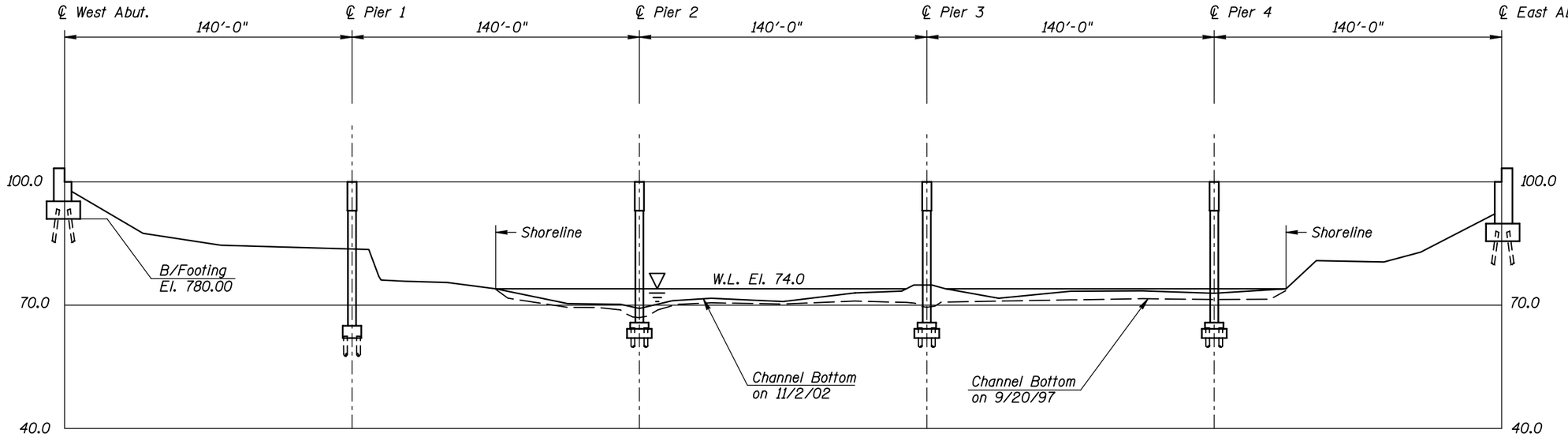
-2.0	Sounding Depth from Waterline (11/2/02)
-5.2	Sounding Depth from Waterline (8/24/97)
	Timber Debris
	Scour Depression

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 07569
OVER THE BLUE EARTH RIVER
DISTRICT 7, BLUE EARTH COUNTY

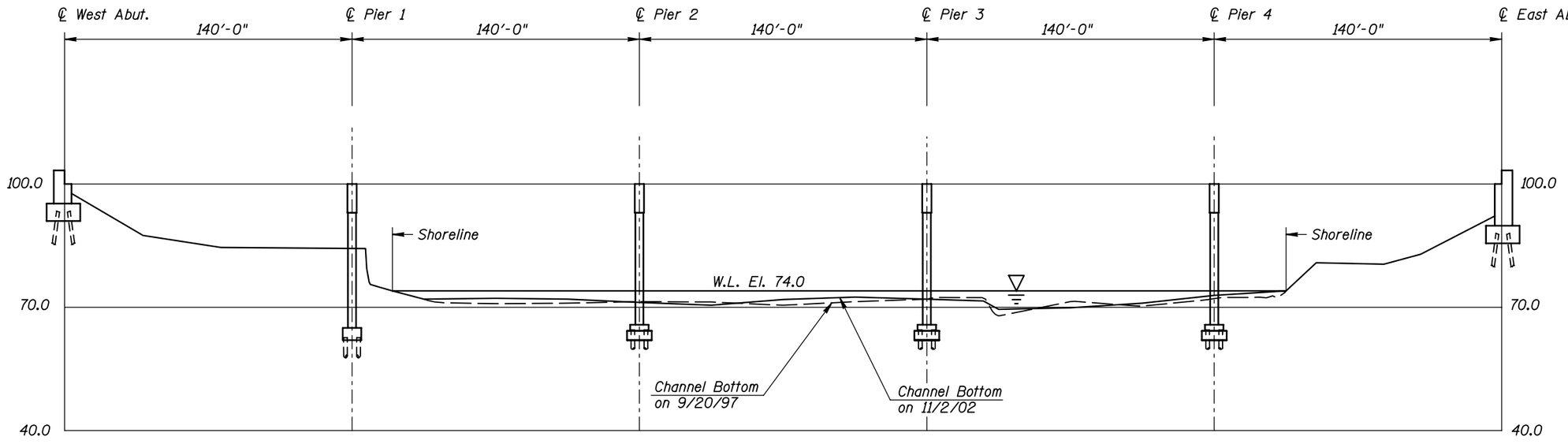
INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35I2028A		Figure No.: 1



UPSTREAM FASCIA PROFILE

Horizontal scale : 1"=60′-0"
Vertical scale : 1"=30′-0"



DOWNSTREAM FASCIA PROFILE

Horizontal scale : 1"=60′-0"
Vertical scale : 1"=30′-0"

Note:

Refer to Figure 1 for General Notes.

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DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 07569
OVER THE BLUE EARTH RIVER
DISTRICT 7, BLUE EARTH COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: As shown
Code: 3512028A		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Northeast.

Photograph 2. View of Pier 2, Looking North. Note the Moderate Timber Accumulation.

Photograph 3. View of Pier 3, Looking West. Note the Heavy Timber Debris Accumulation.

Photograph 4. View of Pier 4, Looking Southwest.

Photograph 5. View of Steep Vertical Erosion Along the East River Bank, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: November 2, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 07569 WEATHER: Sunny, "25E F

WATERWAY CROSSED: The Blue Earth River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR

OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 8:55 a.m.

TIME OUT OF WATER: 9:30 a.m.

WATERWAY DATA: VELOCITY "4 f.p.s.

VISIBILITY "3 feet

DEPTH 4.7 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 2, 3, and 4

REMARKS: Overall, the concrete was in good condition with no defects of structural significance. A local scour depression was observed, maximum 1.5 feet deep with no footing exposure, at the upstream end of Pier 2. Moderate and heavy accumulations of timber debris were encountered around the upstream nose and along the west face of Piers 2 and 3, respectively. Both river banks exhibited steep vertical slopes due to erosion.

FURTHER ACTION NEEDED: ___X___ YES _____ NO

Remove the accumulation of timber debris from the upstream noses of Piers 2 and 3 before it progresses further and adversely affects the piers or their surrounding channel bottom.

Monitor the vertical erosion along the river banks and the scour hole around the upstream nose of Pier 2 during future inspections.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 07569
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Blue Earth River

INSPECTION DATE November 2, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 2	4.7’	N	7	N	9	N	7	7	N	N	6	6	7	N	N	8	N	N
	Pier 3	1.5’	N	7	N	9	N	7	7	N	N	4	4	7	N	N	8	N	N
	Pier 4	4.7’	N	7	N	9	N	7	7	6	N	8	6	7	N	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good condition with no defects of structural significance. A local scour depression was observed, maximum 1.5 feet deep with no footing exposure, at the upstream end of Pier 2. Moderate and heavy accumulations of timber debris were encountered around the upstream nose and along the west face of Piers 2 and 3, respectively. Both river banks exhibited steep vertical slopes due to erosion.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.